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This pamphlet provides information to design and manage a training system to adequately prepare the aerospace team for the demands of the changing tactical, operational, and strategic levels of war. It applies to all active Air Force agencies, Air Force Reserve (AFRES), and Air National Guard (ANG) when published in the NGR (AF) 0-2. A list of abbreviations, acronyms, and terms is contained in **Attachment 1**

1. General Information. To design an adequate training system, a systematic process is necessary to develop, acquire, modify, test, validate, evaluate, support, and manage all training systems. The process is based on a systems perspective that accounts for the total life-cycle requirements of a defense system and its respective mission while providing cradle-to-grave support and management. The systematic process should ensure cradle-to-grave support while enabling one or many different defense systems to accomplish their missions. The term "defense system" encompasses any weapon or support system requiring training for operators, maintainers, or support personnel. The training system should be given the same Air Force precedence rating given the defense system it supports and receive the same visibility, funding, and documentation priority. Training systems should be developed according to AFMAN 36-2234 and comply with Department of Defense Directive (DoDD) 1430.13, AFPD 36-22, and this pamphlet. Training systems should be acquired and modified concurrently with their respective defense systems and according to DoDD 5000.1, DoD Instruction (DoDI) 5000.2, DoD Manual 5000.2, Military Standard (MILSTD) 1379D, *Military Training Programs,* and AFI 10-601. Major commands (MAJCOM) in coordination with Air Reserve Components, should consolidate all their System Training Plans (STP) and develop a Master Training Plan that covers their training strategy, modernization, funding and future R&D needs. ASC/XR should consolidate MAJCOM plans and produce the Air Force training R&D plan as part of the Technology Planning Integrated Product Team (TPIPT) process.

2. System Training Plan (STP):

    2.1. The STP is the heart of the systematic process. The STP should be developed, maintained, and reviewed annually for each defense system when, the training system life cycle costs (not including

acquisition costs) exceed $50 million for fielded systems; or training acquisition costs exceed $10 million for systems in acquisition. Even if a STP is not required, follow the systematic approach to determine training requirements. It should be used to support acquisition and modification processes, requirements documents, and milestone decisions. The STP is an iterative planning document that defines the justification, design, development, funding, resources, support, modification, operation, and management of a training system. The first and probably the most important part of any STP is the mission analysis (may require a classified attachment to the STP). This analysis enables an operating command's experts to prioritize critical tasks and identify possible training gaps later in the Instructional Systems Development (ISD) process. The primary operating command should initiate the STP through a Training Planning Team (TPT) as early as possible for new systems. For systems in acquisition include the STP in the Integrated Manpower, Personnel and Comprehensive Training and Safety (IMPACTS) Program Plan (IPP) as the training input and submit it to HQ USAF/XOO for Air Staff coordination and initial approval by the appropriate HQ USAF/DCS. Changes to STPs after initial HQ USAF/DCS approval are at the discretion of the MAJCOM. As part of the IPP, submit it to SAF/AQP before each milestone decision point, as required. **Table 1.** outlines STP development levels required to support milestone (MS) decisions and reviews. The operating commands should also consider using the STP instead of separate, Computer Resources Life Cycle Management Plan, Integrated Logistics Support Plan, and Test and Evaluation Master Plan documents. The STP is a top level training document including final analysis and conclusions. The details needed to support this analysis can often be maintained in other documents and referenced in the STP. See **Attachment 2** for suggested STP content.

Table 1. STP Requirements for Systems in Acquisition by Milestone.

Phase	Description	Actions	Requirements	Review Process
Preconcept	Preconcept	Predecessor Analysis	Concept Action Group (CAG)/TPT Formed/Preliminary IPP (PIPP)	Mission Review
MS 0	Concept Studies Approval	Develop Alternatives	Training Systems Requirements Analysis (TSRA)/PIPP Initiated	TPT/IPT/ AFSARC/ DAB Review
MS I	Concept Demonstrate Approval	Demonstrate Capabilities	STP (IPP) Concepts Submitted	AFSARC/ DAB Review
MS II	Development Approval	Prepare For Production	STP (IPP) Description Submitted	AFSARC/ DAB Review
MS III	Production Approval	Production	STP (IPP) Implement Program	AFSARC/ DAB Review
MS IV	Major Modification Approval	Modification Review	STP (IPP) Review/Update Modifications	DAB Review (If Required)

2.2. The STP should define the training system requirements for acquisition and modification to support the planning, programming, and budgeting processes. Include the basic concepts and strategies to attain and maintain training system concurrency in the STP. Alternative training strategies and future R&D efforts that could improve training effectiveness/efficiency should also be included. Finally, the STP should establish milestones and schedules to ensure timely development, testing, and fielding of training capability and training support in advance of defense system initial operational capability (IOC). The training systems should be delivered, installed, and logistically supportable by the required assets available (RAA) date to permit testing, training validation, and certification (if required) by the training need date (TND).

3. Training Planning Team for Systems in Acquisition. The primary operating command should set up the TPT and the Concept Action Group (CAG) in the preconcept phase, but not later than phase 0. The operating command should chair the TPT throughout the life cycle of the system. If the team includes

more than one operating command or Service, the designated lead command should chair the team. The command with program management responsibility should help the operating command to develop, maintain, coordinate, and update the STP. The team should be comprised of representatives from the command with program management responsibility, participating and operating commands, test and evaluation, validation and testing, AFRES, ANG, other Services, applicable Laboratories, and designated contractor personnel, when appropriate. A TPT representative should also support the CAG and the IMPACTS Planning Team. The Test and Evaluation Working Group should support the TPT.

4. Concurrency, Modifications, and Configuration Management. Training systems should be acquired, modified, and maintained current with the defense systems they support. The training system should be treated as a single configuration management item. Operational flight program drop-ins in ATDs should be used when economically feasible to enhance currency. The TPT should:

4.1. Evaluate defense system modifications to determine the impact on the training system.

4.2. Review and update the STP annually and when changes affecting training occur in the mission tasking, threat capabilities, tactics, personnel demographics or structure, defense system, training system availability, component capabilities, funding priorities, basing, new training technologies, or operating commands.

4.3. Develop and implement alternate training strategies until the training system can be made concurrent with the defense system. Concurrency and modification strategy should ensure that all personnel are trained before fielding defense system updates. Modifications may be done individually or incorporated in block updates based on training impact.

5. Human Systems Integration (HSI). Total defense system training requirements for each functional area should be identified by a formal, documented TSRA using the instructional system development (ISD) process, systems engineering process, and appropriate military standards for logistic support analysis (LSA). The analysis should establish the requirements and furnish alternative solutions for training system acquisition or modification. HSI considerations should be addressed early to influence design and cost effectiveness by maximizing human performance in both the defense and training systems. Human factors, manpower, personnel, training, safety, and health hazards considerations should be an integral concern of the systems engineering process. HSI should be implemented through the Air Force IMPACTS Program.

6. Training System Requirements Analysis (TSRA). The TSRA starts with the finalization of the task list for each functional area to be trained. The operating command, together with the appropriate Air Force Materiel Command (AFMC) program office System Program Director (SPD) should, with the assistance of the training system product group (as necessary), develop and maintain a Master Training Task List (MTTL) by functional area for each defense system. The MTTL should be derived from analysis of mission tasks, associated defense system tasks, predecessor defense or training system task lists, and additional requirements resulting from personnel and resource availability, safety, security, cost, and environmental constraints imposed by the peacetime training environment. The MTTL should:

6.1. Provide a total listing of tasks to be trained from initial entry into the defense system through upgrade and continuation training.

6.2. Establish a training requirements baseline for all appropriate defense or training system acquisition and modification program documents and programmatic and budgetary decisions.

6.3. Provide the training requirements to support the IMPACTS Program baseline comparison system for modification of follow-on defense system development and acquisition.

6.4. Provide a training requirements baseline so the integrated team defining, acquiring, and evaluating the training system can measure its ability to train personnel in mission accomplishment. Tasks for which personnel cannot be adequately trained should be identified as unmet requirements and documented in the STP as potential limiting factors into the ability to accomplish the wartime mission. The task list should be a validation benchmark of training requirements versus training capability for each defense system.

NOTE:

When developing or updating STPs for mature training systems, a new TSRA for unchanged non-mission critical tasks (e.g. jet engine repair) may not be warranted.

7. Command Relationships:

7.1. Headquarters Air Force offices of primary responsibility (OPR) will provide training system policy, guidance, and oversight of the systematic process. They will help the operating command plan, program, and budget for training systems, to include developing program management directives. They will support TPTs, review, and approve all initial STPs.

7.2. The appropriate TPIPT will recommend training strategies and options to the TPT to satisfy the operating commands training requirements.

7.3. Commands should set up aggressive intercommand coordination programs to transfer lessons learned, ensure availability of quality and timely defense system and training data, share subject matter expertise, provide funding assistance and manpower. Memorandums of Agreement (MOA) should be used to transfer program management responsibilities for designated systems between commands.

8. Training Media. The operating command, together with the AFMC program office SPD should, with the assistance of the training system product group (as necessary), define the role of training media and how it supports the training requirements in the STP. The description should:

8.1. Include an ISD analysis of the ground-based media as it complements hands-on training or supplements training when resource availability, safety, security, cost, and environmental constraints limit using the defense system as a training medium.

8.2. Identify alternatives based on validated opportunities to train, qualify, and certify personnel.

8.3. Integrate subsystems and components in the total training system.

8.4. Recommend areas for R&D technology applications that may improve training system effectiveness/efficiency in the future.

9. Logistics Support. Logistics support for all commercially developed/procured aircrew, missile, space, range, mechanical, computerized, and maintenance training devices will be contracted. When an analysis indicates another method is more appropriate and cost-effective, the operating command, in coordination with the AFMC program office, may request exception to contracted support by formal waiver from HQ USAF/LGM. The operating command should identify to the AFMC program office/

SPD the extent of desired contractor support. The AFMC program office SPD should develop and furnish logistics support from cradle to grave. Training equipment manufactured by an Air Force Trainer Fabrication Organization (TFO) should be supported by the TFO or the operating command ordering the equipment. Transfer of support responsibility may be negotiated by an MOA between the manufacturing activity, the operating command, and AFMC program product group item manager. Computer based training (CBT) and interactive courseware (ICW) procured separately from a training system contract should be supported by the command procuring the equipment. Contract administration for training device contracts shall be provided by DCMDM-NKB unless responsibility is transferred to the operating command by an MOA or contract administration is retained by the procuring contracting officer.

10. Funding. Planning, programming, budgeting, and funding for training system acquisition, modification, operation, maintenance, and support should be initiated together with the defense system. All Air Staff defense and training system program element monitors (PEM) should ensure the training system and its components receive appropriate visibility, priority, and documentation relative to the defense system it supports. Funding priority, visibility, and consistency must be maintained at every level of the funding process. The PEMs are the key to successful support of the training system throughout this process.

10.1. The funding for modification of training systems or components because of defense system changes should be included in the defense system modification program.

10.2. The funding for training system Contractor Logistics Support (CLS) must be identified.

10.3. The funding for acquisition of training systems not associated with a major defense system should be included in the most closely aligned major force program element.

10.4. The operating command should plan, program, and budget for contract training and CLS unless it is acquired as part of the defense system contract or is transferred to another command through a formal MOA.

10.5. The operating command ordering training equipment manufactured by a TFO will fund the equipment and its logistics support. Transfer of funding responsibility may be negotiated by an MOA among the manufacturing activity, the operating command, and the command assuming program management responsibility.

10.6. The operating command procuring CBT and ICW separate from a training system contract will fund the equipment and its logistics support. Transfer of funding responsibility may be negotiated by an MOA between the operating command and the command assuming program management responsibility.

10.7. The operating command, assisted by the TPT, should develop alternate training strategies in the STP, to include methodologies and media, that can be implemented to meet training requirements should funding shortfalls negatively impact training system acquisition, modification, or support.

11. Management of Training Systems. Fielded training systems are managed by the AFMC program office SPD and training systems product group in coordination with the operating MAJCOMs.

12. Air Force Training System and Device Simulator Certification Program:

12.1. Simulator certification (SIMCERT) is an operationally conducted program designed to ensure training systems and devices provide accurate, creditable training in specific tasks. It also provides the operating command with an audit trail for training device effectiveness; provides a key quality

assurance capability to oversee contractor supported training or equipment; and compares the training system with the defense system to establish and document concurrency baselines. For the ANG and AFRES, recommend SIMCERT programs align with the gaining command's program. SIMCERT should be done for all aircrew training devices (ATD) and other training devices as determined by MAJCOM.

12.2. The operating command, with assistance from AFMC program office SPD, the training system product group (as necessary), and participating commands should establish certification requirements, to include tasks, criteria, and certification interval. Each SIMCERT program should have permanent documentation. The SIMCERT program should consist of three types of evaluations; initial certification, recurring certification, and decertification or recertification for specific training tasks.

12.2.1. Initial certification verifies and documents that the trainer meets the training requirements as defined in the STP. This then becomes the baseline for recurring certification evaluations, concurrency, and subsequent solicitations of support contracts. Initial certification of training devices should be done as soon as possible after baseline documentation has been officially received from the development or modification contractor.

12.2.2. Recurring certification ensures the training device continues to perform to the initial certification standards.

12.2.3. Decertification or recertification of a training device for a specific training task ensures that the trainer is used only to credit required training that meets operating command standards. If decertification or recertification is the result of a new requirement levied on the development or modification contractor, a reasonable time should be negotiated before recertification is required.

12.2.3.1. Decertification consists of deleting training tasks from the list of tasks for which the training device is certified and modifying training as necessary.

12.2.3.2. Recertification of a device consists of testing of those tasks that were decertified and others likely to be affected before reinstating those tasks.

NOTE:

The new ATD categories (**Attachment 4**) will enable MAJCOMs to solicit Federal Aviation Administration (FAA) assistance with their SIMCERT process. MAJCOMs should automate their SIMCERT process as much as possible, and include SIMCERT results in the annual review of the STP.

13. Simulator Validation (SIMVAL). The SIMVAL process compares the operating parameters and performance of the electronic warfare portions of simulators to the current intelligence assessment of a weapons system and documents the differences and their impacts. The underlying concept of the SIMVAL process is to integrate SIMVAL test requirements and activities with the simulator acquisition process and current Air Force operations. The SIMVAL process encompasses cradle-to-grave support and should be accomplished according to AFR 80-25.

14. Training Device Inventory. Commands will maintain a training resource inventory (e.g. ATDs, missile training resources, life support equipment, etc.) by category, description, location, number, and type of logistics support and provide it upon request to HQ USAF/XOO.

15. Movement of Training Devices. Movement of training devices should be done according to AFR 65-110. The AFMC product group item manager is the focal point for training device movements except for command-supported devices. Command requests for training device movement must be coordinated with the AFMC product group item manager as soon as possible to provide adequate time to plan, program, and budget. The operating command will fund and accomplish intracommand moves and temporary storage. For intercommand moves, the command receiving the training device should plan, program, and fund the moves and temporary storage. The AFMC product group item manager will fund and accomplish all other movements, storage, or disposal.

16. Refurbishment of Training Devices. Refurbishment should be considered when training capability can be regained or support costs reduced. However, if refurbishment requires contractual action it must be identified early by the operating command for budgeting and contracting.

17. Disposition of Excess Training Devices. Training devices excess to user need will be disposed of by the appropriate AFMC product group item manager after coordinating with the property administrator at DCMDM-NKB. The AFMC product group item manager will query other training and defense system item managers, MAJCOMs, ANG/AFRES, other Uniformed Services, DoD organizations, International Military Training, Air Force Museum, and other interested organizations in this order, to determine training device or spare parts requirements before final disposition. See paragraph **19.** for lease or loan procedures. Command-supported devices should be disposed of by the owning command after coordinating with the appropriate agencies for transfer. Conflicting priorities should be resolved by the appropriate HQ USAF OPR.

18. Disposition of Excess Training Material. Excess courseware, firmware, and hardware, when obsolete or excess to Air Force needs, may have utility for other agencies or countries, particularly to Security Assistance programs. Commands should identify excess, accountable training aids or equipment to the appropriate AFMC training system product group item manager. Identification should include nomenclature, stock number or part number, quantity, condition code, and availability time frame.

19. Lease or Loan of Training Devices:

19.1. Periodically, training devices become "temporarily excess" (not required for Air Force need at this time). In these cases the AFMC product group item manager should make these devices available for lease or loan to interested non-US Governmental organizations according to AFM 67-1, at no cost to the Government. The loan agreement will be made between the AFMC training system product group item manager in coordination with DCMDM-NKB and the authorized borrower according to AFM 67-1 procedures. These lease or loan agreements may be terminated at any time, at the Government's option, if need dictates. The period of lease or loan is 3 years. To assess the user's training device facilities, utilization rates, and overall trainer integration into course curriculum, the following paragraph should be added to all lease or loan agreements:

"The authorized borrower shall submit to a no-notice inspection by the Air Force, of simulator maintenance and associated records, facilities, schedules, and curriculum to include, but not limited to usage rates and users. Inspections should not exceed one visit for each 3-year loan agreement. All funding for the no-notice inspection should be provided by the borrower and should include air fare, rental car, and standard Air Force per diem."

19.2. All borrower requests to extend a lease or loan agreement should be submitted in writing to the AFMC loan control officer not later than 30 days before expiration of the loan period according to AFM 67-1. The loan control officer should send the extension request to the appropriate item manager.

20. Trainer Fabrication Organizations:

20.1. Command TFOs provide organic capability to design and fabricate training equipment that is responsive to the needs of the commander. TFOs may provide a more expeditious, flexible, and less costly procurement option. Command training system managers should consider TFOs as an optional source of procurement to support existing and developing defense system training programs when:

20.1.1. No commercial equivalent can meet the requirement.

20.1.2. The requirement is specifically one of a kind, a prototype, or proof of concept to establish procurement and cost data.

20.1.3. Off the shelf or best commercial practices do not provide the most efficient, cost-effective solution.

20.2. The Department of Defense component may exempt a commercial activity when there will be an unacceptable delay or disruption of an essential program. The exemption is predicated on the following and must be documented:

20.2.1. The delay or disruption must be specific as to cost, time, and performance measures.

20.2.2. The disruption or delay must be shown to be of a lasting or unacceptable nature.

20.2.3. The commercial sources are not able, and that the Government is able, to provide the product or service needed.

20.3. TFOs, with the exception of ASC/AMF (DMMF), are exempt from cost comparison until February 21, 1995 when TFO use will prevent an unacceptable delay or disruption of an essential program. Operating commands should approve authorizations of field manufactured training aids. Commands possessing trainer fabrication facilities should develop their own procedures for logistically supporting them as well as their end products. The command should provide the production standards, technical and operational data, and logistics. Command TFOs possessing special fabrication capabilities or expertise (**Attachment 3**) should provide support to other command fabrication organizations. When an exchange is agreed upon, the respective MAJCOMs should approve the exchange of services or products through an MOA. In the MOA:

20.3.1. TFOs should not place a charge or fee for work, only actual production costs may be charged.

20.3.2. The customer should identify the maximum funds they will be able to commit and the time frame in which the service is required.

20.3.3. No special incentive or nonperformance clause should be included.

21. Aircrew Training Device Standards. CSAF directed the establishment of standard ATD terminology and their use in the requirements and acquisition process following the 4-star Flight Simulator Review, May 10, 1993. Utilizing the FAA based definitions found in**Attachment 1**, we categorized the major Air Force ATDs found in **Attachment 4**. While the names of ATDs are not restricted and continue

to describe ATD use, all ATDs must be placed in one of the following categories: Aircraft Systems Trainer (AST), Level 4-7 Flight Training Device (FTD), Level A-D Simulator, or Other. No special certification is needed for the initial categorization of fielded ATDs. MAJCOMs have the authority to rename and recategorize ATDs, but may need aircraft flight data to confirm the proper category if future ATD modifications affect the ATD's original aero model. The new categories and training tables (**Attachment 5**) will assist the training developers during the ISD process and should translate directly to the acquisition phase and reduce ATD specification requirements. As these tables mature and studies refine the fidelity/training task relationship, the requirements and acquisition process for ATDs will continue to improve. Standards for ATD data bases, threat and weapon models, visual displays and image generators are also needed and will be referenced in this pamphlet as they are developed and approved.

22. Training Technology. The appropriate AFMC TPIPT will provide the TPT with an array of system concept options for consideration in their STP. MAJCOMs should consolidate individual training R&D recommendations from their STPs that could improve training effectiveness/efficiency and provide them to the TPIPT. Armstrong Laboratory will continue pursuing high quality flight simulation at low cost through technology demonstrators in an effort to replace high cost fighter type flight training devices with lower cost devices. Also, they will continue pursuing demonstration and transition of applicable technologies and methodologies to improve aircrew training.

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Attachment 1

GLOSSARY OF ABBREVIATIONS, ACRONYMS, AND TERMS

Abbreviations and Acronyms

AFRES—Air Force Reserve

AFSC—Air Force Specialty Code

ANG—Air National Guard

CAG—Concept Action Group

CBT—Computer Based Training

CLS—Contractor Logistics Support

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

FOC—Full Operational Capability

HQ AFMC—Headquarters Air Force Materiel Command

HQ USAF—Headquarters US Air Force

HSI—Human Systems Integration

ICW—Interactive Courseware

IMPACTS—Integrated Manpower Personnel and Comprehensive Training and Safety

IOC—Initial Operational Capability

IPP—IMPACTS Program Plan

ISD—Instructional System Development

LSA—Logistic Support Analysis

MAJCOM—Major Command

MILSTD—Military Standard

MOA—Memorandum of Agreement

MPT—Manpower, Personnel, and Training

MS—Milestone

MTTL—Master Training Task List

OPR—Office of Primary Responsibility

PEM—Program Element Monitor

PIPP—Preliminary IMPACTS Program Plan

RAA—Required Assets Available

SIMCERT—Simulator Certification

SIMVAL—Simulator Validation

STP—System Training Plan

SUPT—Specialized Undergraduate Pilot Training

TFO—Trainer Fabrication Organization

TND—Training Need Date

TPT—Training Planning Team

TSRA—Training System Requirements Analysis

Terms

Airborne Procedures Trainer—A high fidelity training device used to train airborne launch control system crewmembers and battle staffs. It provides individual or full crew training in all aspects of system operation.

Aircraft Flight Simulator (Level A Through Level D):

*Level A - Flight Simulator--*To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level A flight simulators may be used for specified pilot recency of experience requirements and specific flight operational task training requirements in transition, upgrade, recurrent, and requalification training as described in this pamphlet. It may also be used for initial training on specific events for recent SUPT graduates. Level A flight simulators have the following characteristics and components:

Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's training program.

Systems which respond appropriately to switches and controls of the aircraft being simulated.

Full-scale replica of the cockpit of the aircraft being simulated.

Correct simulation of the aerodynamic characteristics of the aircraft being simulated.

Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter.

Control forces and travel which correspond to the aircraft.

Instructor controls and seat.

At least a night visual system with the minimum of a 45 degree horizontal by 30 degree vertical field of view for each pilot station.

A motion system with at least 3 degrees of freedom.

*Level B - Flight Simulator--*To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level B flight simulators may be used for pilot recency of experience requirements and for specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training as described in this pamphlet. It may also be used for initial training on specific events for recent SUPT graduates. Level B flight simulators have the following characteristics and components:

Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's training program.

Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated.

Full-scale replica of the cockpit of the aircraft being simulated.

Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated.

Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter.

Control forces and travel which correspond to the aircraft.

Instructor controls and seat.

At least a night visual system with a minimum of a 45 degree horizontal by 30 degree vertical field of view for each pilot station.

A motion system with at least 3 degrees of freedom.

*Level C - Flight Simulator--*To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level C flight simulators may be used for pilot recency of experience requirements and for specified flight operational task training as described in this pamphlet. It may also be used for initial training on specific events for recent SUPT graduates. Level C flight simulators have at least the following characteristics and components:

Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's training program.

Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated.

Full-scale replica of the cockpit of the aircraft being simulated.

Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated.

Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter.

Control forces, dynamics, and travel which correspond to the aircraft.

Instructor controls and seat.

At least a night and dusk visual system with a minimum of a 75 degree horizontal by 30 degree vertical field of view for each pilot station.

A motion system with at least 6 degrees of freedom.

*Level D - Flight Simulator--*To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level D flight simulators may be used for specified pilot recency of experience requirements and specific flight operational task training requirements in transition, upgrade, recurrent, and requalification training as described in this pamphlet. It may also be used for initial training on specific events for recent SUPT graduates. Level D flight simulators have the following characteristics and components:

Systems representations, switches, and controls which are required by the design of the aircraft and by the user's training program.

Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated.

Full-scale replica of the cockpit of the aircraft being simulated.

Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated.

Correct simulation of selected environmentally affected aerodynamic and ground dynamic characteristics of the aircraft being simulated considering the full range of its flight envelope in all approved configurations.

Correct and realistic simulation of the effects of environmental conditions which the aircraft might encounter.

Control forces, dynamics, and travel which correspond to the aircraft.

Instructor controls and seat.

A daylight, dusk, and night visual system with the minimum of a 75 degree horizontal by 30 degree vertical field of view for each pilot station.

A motion system with at least 6 degrees of freedom.

Aircraft Flight Training Device (Level 1 Through Level 7):

*Level 1 - Level 3 Flight Training Device--*Not defined for USAF use.

Level 4 - Flight Training Device--To permit learning, development, and the practice of skills and cockpit procedures necessary for understanding and operating the integrated systems of a specific aircraft. A level 4 training device has the following characteristics and components:

A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished.

Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished.

Air/ground logic (however, simulated aerodynamic capabilities are not required).

*Level 5 - Flight Training Device--*To permit learning, development, and the practice of skills, cockpit procedures, and instrument flight procedures necessary for understanding and operating the integrated systems of a specific aircraft in typical flight operations in real time. A level 5 training device has the following characteristics and components:

A replica of the flight deck panels, switches, controls, and instrument, in proper relationship, to represent the aircraft for which training is to be accomplished.

Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished.

Simulated aerodynamic capabilities representative of the aircraft group or class.

Functional flight and navigational controls, displays, and instrumentation.

Control forces and control travel of sufficient precision for manually flying an instrument approach.

*Level 6 - Flight Training Device--*To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures, certain symmetrical maneuvers, and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical operations. A level 6 training device has the following characteristics and components:

Systems indications which respond appropriately to switches and controls which are required to be installed.

A replica of the cockpit of the aircraft for which training is to be accomplished.

Simulated aerodynamic capabilities which closely represent the specific aircraft in ground and flight operations.

Functional flight and navigational controls, displays, and instrumentation.

Control forces and control travel which correspond to the aircraft.

instructor controls.

*Level 7 - Flight Training Device--*To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures and maneuvers, and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations. A level 7 training device has the following characteristics and components:

Systems representations, switches, and controls which are required by the design of the aircraft and by the approved training program.

Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated.

Full-scale replica of the cockpit of the aircraft being simulated.

Correct simulation of the aerodynamic and ground dynamic characteristics of the aircraft being simulated.

Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter.

Control forces, dynamics, and travel which correspond to the aircraft.

Instructor controls and seat.

Aircraft System Trainer (AST)—A training device that is usually hardware oriented, using actual or replicated aircraft components to a specified fidelity level. It is designed to train personnel (usually maintenance) on specific systems and subsystems that are conducive to hardware approaches, such as a landing gear system or egress system.

Aircrew—The total complement of rated (pilots, navigators, observers, and flight surgeons) and nonrated personnel (1AXXX AFSCs) responsible for the safe ground and flight operation of the aircraft and onboard systems. Individuals must be on aeronautical orders and assigned to an authorized aircrew position according to AFI 65-503. Aircrew members perform their principal duties inflight. Duties must be essential to operating the aircraft/mission systems and associated equipment used for completing a mission.

Aircrew Training Device (ATD)—A training device used to prepare aircrew members for the actual performance of flight duties. The official categories for ATDs are Flight Simulators, Flight Training Devices, Aircraft System Trainers, and Other (for those that do not fall into the first three categories). ATDs can be described as: cockpit familiarization trainer, cockpit procedures trainer, operational flight

trainer, part task trainer, and weapon system trainer to name a few.

Aircrew Training System (ATS)—The instructional system used to train aircrew members. It includes training equipment, software, firmware, hardware, devices, courseware, training system support, logistics support, ground-based instruction, media, and facilities. Typically, flight training or aircraft support is not included if contractor produced.

Baseline Comparison System (BCS)—An existing or predecessor system or combination of systems with characteristics similar to the proposed weapons system. Normally defined during front-end analysis to help predict proposed weapons system manpower, personnel, and training requirements.

Block Update—A process whereby several modifications may be grouped together to maintain training system concurrency in the most cost-effective, efficient manner, while reducing training device downtime.

Cockpit Familiarization Trainer (CFT)—A device that looks like the aircrew stations of a specific aircraft. It is used to teach the location of the controls, instruments, switches, and lights and to practice tasks, such as checklist use, normal procedures, and emergency procedures. The controls, switches, and instruments do not have to respond to trainee inputs.

Cockpit Procedures Trainer (CPT)—A device used to train normal, emergency, and instrument procedures. Aircraft instruments and other displays are activated to respond to flight control and switch inputs; however, exact dynamic simulation of all functions is not required. This trainer provides safety-of-flight training.

Computer Based Training (CBT)—Training in which computers are used for both training delivery and training management. The management functions often include scheduling, lesson selection, score keeping, and quality of student responses.

Concurrency—The condition of ready for training being achieved on the training need date, and the functions and operation of the training system and its supporting equipment and materials must match the supported defense system.

Contract Data Requirements List (CDRL)—A list of the data requirements that are authorized to be acquired for a specific acquisition, which is made a part of the contract. (MILSTD 1379D)

Contract Logistics Support (CLS)—A preplanned method used to provide all or part of the logistics support for a system, subsystem, modification, or equipment throughout its entire life cycle. CLS covers depot maintenance and, as negotiated with the operating command, necessary organizational and intermediate level maintenance, software support, and other operation and maintenance tasks.

Contractor Support (CS)—A generic term that describes a support method of supplementing Air Force logistics resources either for a temporary period or for the life of a system or equipment.

Cost-Effectiveness—A measure of the operational capability added by a system as a function of its life-cycle cost. (DoDI 5000.2)

Course—Logically grouped instruction on a subject, designed to achieve defined learning objectives. A complete series of instructional units identified by a common title or number. An ordered arrangement of subject matter designed to instruct personnel in the knowledge, skills, or techniques required in the performance of tasks in a designated area of specialization. (MILSTD 1379D)

Courseware—All instructional material including technical data, textual materials, and audiotapes,

slides, movies, video tapes, video discs, and other audiovisual materials.

Cockpit/Crew Resource Management (CRM)—The effective utilization of all available resources -- people, weapon systems, facilities, and equipment -- by individuals or crews to safely and effectively accomplish an assigned mission or task. The term "CRM" will be used to refer to the training program, objectives, and key skills directed to this end. MAJCOMs may implement their programs as either "cockpit" or "crew" resource management based on their respective missions.

Defense System—Any weapon system, support system, or end item that supports a specific military mission, therefore, requiring operations, maintenance, or support personnel training.

Designed Operational Capability (DOC)—A mission for which a measured unit has been equipped, organized, designed, tasked, and trained.

Desktop Training Device—An off-the-shelf, commercially available computer-based training system, consisting of both hardware and software.

Embedded Training (ET)—Training provided by capabilities not specifically required for mission completion, but that are built into or added onto operational systems, subsystems, or equipment to enhance or maintain user skill proficiency.

Evaluation—A judgment expressed as a measure or ranking of trainee achievement, instructor performance, process, application, training material, and other factors. (MILSTD 1379D)

Fidelity—The degree to which a training device represents actual defense system performance, characteristics, and environment.

Firmware—The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device. The software cannot be readily modified under program control. (DoDI 5000.2)

Flight Training Device—A training device that permits learning, development, and the practice of skills and cockpit procedures necessary for understanding and operating the integrated systems of a specific aircraft.

Formative Evaluation—An evaluation that provides information about the effectiveness of training materials to meet training objectives and the trainee acceptance of training materials as they are being developed. (MILSTD 1379D)

Front-End Analysis (FEA)—A process that evaluates requirements for manpower, personnel, and training (MPT) during the early stages of the military system acquisition cycle. Its purpose is to determine manpower, personnel, training, and safety requirements under alternative system concepts and designs and to estimate the impact of these MPT requirements on system effectiveness and life-cycle costs.

Guaranteed Student—The product of a contracted training system that assures graduates achieve specific performance levels according to the approved user tasks and standards documents.

Human Factors Engineering—The application of human performance principles, models, measurements, and techniques to system design. Human performance as an integral part of system design characteristics that affect the efficiency of operating, servicing, programming, and repairing the system.

Human Systems Integration—The process of effective integration of human factors engineering, manpower, personnel, training, health hazards, and safety considerations into the acquisition of defense

systems to improve total system performance and reduce costs by focusing attention on the capabilities and limitations of humans. (DoDI 5000.2)

Implementing Command—The command or agency designated by the Air Force Acquisition Executive to manage an acquisition program. (AFI 10-601)

Initial Operational Capability (IOC)—The first attainment of the capability to employ effectively a weapon, item of equipment, or system of approved specific characteristics, and which is manned or operated by an adequately trained, equipped, and supported military unit or force. (Joint Pub 1-02)

Instructional System Development (ISD)—A deliberate and orderly process for planning and developing instructional programs that make sure personnel are taught the knowledge, skills, and attitudes essential for successful job performance. Depends on a description and analysis of the tasks necessary for performing the job, objectives, and tests clearly stated before instruction begins, evaluation procedures to determine whether or not the objectives have been reached, and methods for revising the process based on empirical data. (AFMAN 36-2234)

Instrument Flight Trainer—An aircrew training device that trains flight crews in instrument flight procedures.

Integrated Manpower, Personnel and Comprehensive Training and Safe—*ty*--Headquarters US Air Force/Manpower and Organization-sponsored acquisition management program that implements the specific Human Systems Integration policy outlined in Department of Defense Instruction 5000.2. It is a comprehensive management and technical approach for addressing the human centered elements of manpower, personnel, training, safety, health hazards, and human factors engineering in the acquisition of new or improved systems.

Interactive Courseware (ICW)—A computer program controlled instruction that relies on trainee input to determine the order and pace of instruction delivery. (MILSTD 1379D)

Maintenance Trainer (MT)—A training device designed to train maintenance personnel on specification systems or subsystems.

Major Command (MAJCOM)—A major subdivision of the Air Force that is assigned a major part of the Air Force mission. MAJCOMs report directly to Headquarters US Air Force.

Media—The delivery vehicle for presenting instructional material or the basic communication stimuli presented to a student to induce learning. (MILSTD 1379D)

Missile Procedures Trainer (MIPT)—A high fidelity device that reproduces the environment and command and control functions of a launch control center. It provides individual or crew training in most aspects of the operational mission.

Missile System Trainer (MST)—A device that is hardware oriented, using actual or replicated missile components to a specified fidelity level. It is designed to train maintenance personnel on specific systems and subsystems that are conducive to hardware approaches.

Mission Analysis—A process of reviewing mission requirements, developing collective task statements, and arranging the collective tasks in a hierarchical relationship. (MILSTD 1379D)

Mission Rehearsal—Conduct of a specific mission in an environment of adequate fidelity to practice, test, and assess crews, plans, support, tactics, command, control, communications, intelligence, and probability of success.

Mission Rehearsal Device (MRD)—A training device that supports mission rehearsal.

Mission Trainer—A trainer that provides the trainees with a simulated warfare environment that is specifically mission oriented to the type of weapon system involved. The trainer can provide specific weapon system operator modes or a mission mode that requires tactical decision making. (Does not have to include pilot or copilot flight dynamics training.)

Mobile Training Set (MTS)—A portable set of system training equipment, consisting of trainers, training aids, operational equipment, bench training sets, support equipment, technical publications, computer software, standard Air Force material, audiovisual products, and audiovisual equipment designed primarily for use by Air Education and Training Command for onsite training of maintenance personnel in field training programs.

Nonsystem Training Device (NSTD)—A training device not supporting a single, specific, parent defense system (DoDD 1430.13).

Operating Command—The command primarily operating a system, subsystem, or item of equipment. Generally applies to those operational commands or organizations designated by Headquarters US Air Force to conduct or participate in operations or operational testing.

Operational Crew—Nonaircrew operational personnel assigned crew duties, such as missile launch, space, control tower, radar approach, weather, and base power management.

Operational Flight Trainer (OFT)—A device that dynamically simulates the flight characteristics of the designated aircraft to train flight crews in normal cockpit procedures, instrument flight procedures, emergency procedures, and limited combat mission execution. This trainer combines safety-of-flight operation and some warfighting tasks, and provides integration of skills.

Participating Command—A command or agency designated by the Air Force Acquisition Executive to advise the program manager and to take an active part in developing a weapon system. The supporting command is also a participating command (AFI 10-601).

Part Task Trainer (PTT)—Operator trainers that let selected aspects of a task fuel system operation, hydraulic system operation, radar operation, etc. be practiced and a high degree of skill developed independently of other elements of the task (AFM 11-1).

Phased Approach—A process whereby training capability of a training system and its components are incrementally fielded based on user training need and required assets available, ready for training, and initial operational capability dates; the maturity of the weapon system and associated tactics; and the capability to provide logistical support.

Project Officer (PO)—The operating command coordinator at a site assigned to make sure Air Force activities and the contractor have a central point of contact for contract administration, logistic support, and security support as determined from the contract. PO duties can be assigned to personnel within the organization or to the Quality Assurance Representative.

Quality Assurance (QA)—Those actions taken by the government to assure that services meet the requirements in the statement of work. (MILSTD 1379D)

Quality Assurance Representative (QAR)—The person responsible for checking and evaluating contractor performance.

Ready for Training (RFT)—The date on which sufficient equipment, training capabilities, personnel,

and logistics elements are available to support full operational training.

Ready for Use (RFU)—The date on which the training system can be used for productive training.

Required Assets Available (RAA)—The date agreed to by the operating command and Headquarters Air Force Materiel Command where sufficient equipment, personnel, and logistics elements are available to the operational command to begin a trial period for equipment operation and support capability before initial operational capability. Logistics elements include approved operational support equipment, critical spares, verified technical manuals, and training programs and courses.

Safety-of-Flight—Those normal, emergency, instrument, and basic operational procedures determined by the operating command to safely conduct flying operations.

Simulation—A method for implementing a model over time. Also, a technique for testing, analysis, or training in which real-world systems are used, or where real-world and conceptual systems are prepared by a model. (DODD 5000.59)

Simulator—A training device that permits development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position

Simulator Certification (SIMCERT)—The process of ensuring through validation of hardware and software baselines that a training system and its components provide the capability to train personnel to do specific tasks. The process also makes sure the device continues to perform to the delivered specifications, performance criteria, and configuration levels. It will also set up an audit trail regarding specification and baseline data for compliance and subsequent contract solicitation or device modification.

Simulator Validation (SIMVAL)—The process for determining the extent to which a simulator represents the current intelligence assessment of the system. This process includes generation and deployment of an intelligence data baseline of the system, comparison of simulator characteristics and performance, support for the modification and upgrade of the simulator, a comparison of simulator and threat operating procedures, and correction of any significant deficiencies. Uncorrected deficiencies are identified and published in validation reports. The process continues throughout the life cycle of the simulator.

Situational Awareness—In flying this refers to a pilot's continuous perception of self and aircraft in relation to the dynamic environment of flight, threats, and mission, and the ability to forecast, then execute tasks based upon that perception.

Source Data Integrity Program—A program designed to ensure timely, quality military standard baseline source data are provided by the defense system developer to the training system or component developer throughout the life cycle of the system.

Space Operations Familiarization Trainer (SOFT)—A training device that looks like the space operations or missile warning station or console of a specific space or missile warning operations center. It is used to teach the location of the data display, switches, buttons, and warning indicators, and to practice tasks such as system checklist use, normal procedures, and event procedures. The displays switches and indicators do not have to respond to trainee inputs.

Space Operations Mission Trainer (SOMT)—A training device that enables the trainee to experience specific space operations and missile warning tasks in a simulated environment. The trainer provides

operational or real-world events that require decision making and provide for integration of crewmember skills. The trainee is confronted with operations center sensors to simulate real-world space operations events.

Space Operations Procedures Trainer (SOPT)—A training device used to train personnel in normal, event, and event processing procedures. Operations displays and other console indicators are activated to respond to operations crew inputs; however, exact dynamic simulation of all functions is not required.

Space Operations System Trainer (SOST)—A training device that provides a system specific space operations center environment in which crewmembers learn, develop, improve, and integrate the skills associated with their crew position in a specific space operations system. Crew members may operate individually or as an operations crew in the execution of real-world or warfighting missions or events.

Space Operations Training Equipment (SOTE)—Training equipment used by crewmembers assigned to space operations and missile warning duties such as crew commanders, deputy crew commanders, operations crew chiefs, systems operators, and console operators. This trainer provides general space operations knowledge level training.

Stimulation—The process whereby operational equipment can be artificially induced to replicate the operational environment to exploit additional training capabilities of the weapon system.

Summative Evaluation—The overall assessment of a program at the completion of the developmental process. (MILSTD 1379D)

Supporting Command—The command (usually Headquarters Air Force Materiel Command) responsible for providing logistics support for a system and assuming program management responsibility from the implementing command. (AFI 10-601)

System Training Plan (STP)—Is an iterative planning document that defines the justification, design, development, funding, resources, support, modification, operation, and management of a training system. The STP is designed to provide for planning and implementation of training and to make sure all resources and supporting actions required for establishment and support are considered.

Task Analysis:—

- *Job Task Analysis*--A process of examining a specific job to identify all the duties and tasks that are performed by the job incumbent at a given skill level.

- *Training Task Analysis*--The process of examining each unique unit of work from job task analysis to derive descriptive information used in the design, development, and testing of training products. (MILSTD 1379D)

Technology Planning Integrated Product Team (TPIPT)—TPIPTs are multi-constituent teams of Users and AFMC laboratories, SPOs, development planners, and industry to generate, consolidate, and analyze an array of concept options that address the User's needs. The points of contact for TPIPTs are in the product center XR organizations.

TEMPEST—An unclassified term referring to technical investigations for compromising emanations for electrically operated information processing equipment; these investigations are conducted in support of emanations and emissions security. (JP2-01.2)

Total Contract Training (TCT)—A training concept that includes contractor logistics support for a contractor-operated training system. Includes instructors, curriculum, courseware, facilities, trainers, aircraft, spares, support equipment, and other support elements of contractor logistics support. The

purpose of a TCT is to provide a trained student.

Training—Instruction and applied exercises for the acquisition and retention of skills, knowledge, and attitudes required to accomplish military tasks. (DoDD 1322.18)

- ***Collective Training--***Instruction and applied exercises that prepare an organizational team (such as a squad, aircrew, battalion, or multi-Service task force) to accomplish required military tasks as a unit.

- ***Individual Training--***Instruction provided to an individual military member, either in a centralized training organization or in an operational unit, that prepares the member to perform specified military tasks.

- ***Institutional Training--***Individual training conducted in a school or training center of a centralized training organization.

- ***On-the-Job-Training--***Individual training in designated job skills provided to individual members when serving in job positions in operational units.

- ***Unit Training--***Individual or collective training conducted by an operational unit.

Training Aid—Any item which is developed and/or procured with the primary intent that it shall assist in training and the process of learning. (Joint Pub 1-02)

Training Equipment—Material used in training. (MILSTD 1379D)

Training Facility—A permanent or semipermanent military real property or contractor property used for the purposes of conducting training. (MILSTD 1379D)

Training Management System (TMS)—A set of operational tools to help training system managers in controlling and enhancing the evolution of a training system during the life cycle. Modules consist of administration, curriculum management, resource management, schedule management, performance measurement, configuration management, logistics management, and reports.

Training Need Date (TND)—The specified date or milestone (from the requirements documentation as amended) when the training system should be ready for training.

Training Planning Team (TPT)—An action group composed of representatives from all pertinent functional areas, disciplines, and interests involved in the life cycle design, development, acquisition, support, modification, funding, and management of a specific defense training system. The TPT uses the system training plan to ensure training considerations are adequately addressed in the defense system acquisition and modification processes.

Training Requirement—The skills and knowledge that are required for satisfying the job performance requirements and are not already in the students' incoming repertoire.

Training System—A systematically developed curriculum including, but not necessarily limited to, courseware, classroom aids, training simulators and devices, operational equipment, embedded training capability, and personnel to operate, maintain, or employ a system. The training system includes all necessary elements of logistic support.

Training System Readiness Review (TSRR)—The meeting between the contractor and the Air Force to support an Air Force decision on the suitability of the aircrew training system based on the results of summative evaluation.

Training System Requirements Analysis (TSRA)—A systematic approach to front-end analysis of a

defense system based upon an integrated instructional systems development or systems engineering process that develops data items to document the training and preliminary system requirements.

Training System Support Center (TSSC)—A consolidated function that contains the personnel, equipment, facilities, tools, and data necessary to provide all or part of life-cycle courseware, hardware, and software support for a training system.

Training Task List (TTL)—Documentation of total training tasks developed for a defense system and its respective mission. It includes the entire spectrum of tasks in each functional area (operations, maintenance, and support) requiring training. The TTL provides the training task baseline for all acquisition, modification, support, management, and funding actions through comparison with predecessor or future weapon systems.

Utilization Rates—The rate of actual resource use versus planned resource use.

Validation—The process by which the curriculum materials and instruction media materials are reviewed by the contractor for instructional accuracy and adequacy, suitability for presentation, and effectiveness in providing for the trainees' accomplishment of the learning objectives. (MILSTD 1379D)

Weapon System—A combination of one or more weapons with all related equipment, materials, services, personnel, and means of delivery and deployment (if applicable) required for self-sufficiency. (Joint Pub 1-02) For this pamphlet, that portion of the system that conducts the mission.

Weapon System Trainer (WST)—A device that provides an artificial training or tactics environment in which operators learn, develop, improve, and integrate mission skills associated with their crew position in a specific defense system.

Attachment 2

SUGGESTED SYSTEM TRAINING PLAN CONTENT

The STP is a "top level" document. Provide enough detail only as sufficient to explain command programs (final analysis and conclusions). The details needed to support this analysis can often be maintained in other documents and referenced in the STP. Do not forget to include a thorough analysis of the defense system mission, training shortfalls, and potential technological solutions. For fielded systems, some acquisition items may not apply.

A2.1. Executive Summary. Provide an overview of the STP. Highlight sufficient and significant elements to support your command's program, shortfalls, and future objectives. Briefly describe the overall mission of the defense system, the training system, and requirements. Show the relationship of the resource to meeting the overall mission, shortfalls, and alternatives.

A2.2. Mission and Defense System Description. Describe the defense system and mission based on the operational requirement, threat environment, and the designed operational capability, when determined. Include a thorough analysis of the defense system mission. A classified attachment may be required. Include title, nomenclature, program elements for budget, security classification, defense system priority rating, and principal agencies. Identify lead for procurement, lead for training, and users. Reference other plans and documents that support the defense or training system acquisition and modification process. Include a brief summary of baseline system to be replaced, modified, or augmented; shortcomings, displacement, or disposition, if being replaced.

A2.3. Training System Description. Describe the total training system by functional area, including instructional strategy, duration, content, media, training devices and utilization rates, and facilities. Provide strategy and alternative methodologies throughout the training continuum for initial training, on-the-job training, in unit training (i.e. continuation and career progression training), required qualification levels, reentry qualifications, evaluation points, training concept during hostilities, etc. Identify means to acquire training equipment and facilities. Estimate training qualification time required to full proficiency. Include description of data base, systems integration, networking protocols, compatibility, transportability, deployability, etc., requirements. Address ability to efficiently and cost effectively modify training system software concurrently with the defense system. Identify requirement for CBT and ICW. Provide course summary document.

A2.3.1. Diagram on a time continuum, the training progression of each flying and maintenance functional area from entry-into to exit-from the defense system. Identify on the continuum all qualification levels, evaluation checkpoints, and reentry qualification points. State the policy upon which decisions will be based for critical points, such as course sequence, media allocation, in-flight training, and qualification evaluation. Indicate basic training principles to be taken into account, such as building-block approach.

A2.3.2. Describe:

A2.3.2.1. Operator Training System.

A2.3.2.2. Maintenance Training System.

A2.3.2.3. Support (Depot) Training System.

A2.3.3. List and describe training system components role, use, and capabilities:

A2.3.3.1. Actual defense and non defense system equipment.

A2.3.3.2. Operational support equipment.

A2.3.3.3. Part task trainers.

A2.3.3.4. Courseware and training aids.

A2.3.3.5. Training devices (simulation, stimulation,).

A2.3.3.6. Interactive courseware equipment.

A2.3.3.7. Embedded training capability in the defense system.

A2.3.3.8. Defense system.

A2.3.4. Describe Reserve and National Guard participation.

A2.3.5. Identify all Joint training and training with potential sister Service applications.

A2.3.6. Address potential or unresolved training issues.

A2.4. Training System Requirements. Describe how manpower, personnel, training, safety, human factors engineering, and health hazards considerations are applied to the design and development of the defense or training system to reduce costs and enhance capabilities. Establish initial objectives that support readiness, force structure, affordability, and operational objectives.

A2.4.1. Instructional Systems Development Summary. Identify and assess training requirements to influence system design, optimize selection of training alternatives, and make sure system data is available for training system development to ensure required training resources are programmed.

A2.4.1.1. Training System Requirements Analysis. Provide results of ISD, systems engineering, and LSA applications that were used to develop the program. Compare predecessor MTTLs for the mission and defense system with TSRA results for new defense system. Develop MTTL for new system.

A2.4.1.2. Implementation. Describe data sources, implementation procedures, special authorization or approvals, and assign responsibilities. Identify those training areas not supported by a complete task analysis process

A2.4.2. Training System Concurrency Strategy. Identify and group critical training tasks consistent with mission training development and implementation that impact concurrency. When incremental (phased) delivery of training capability is advantageous or necessary, training capabilities should support the following priorities as agreed to by the operating command:

A2.4.2.1. Safety training requirements and tasks.

A2.4.2.2. Warfighting training requirements and tasks.

A2.4.2.3. Full mission training and rehearsal requirements and tasks.

A2.4.3. Organizing Interfaces. MOAs between Government and contracting agencies necessary to ensure timely approvals and data, equipment, and property transfers should be garnered concurrent with the first contract award and renewed throughout the life cycle of the defense and training system. Include MOUs and other agreements. Briefly spell out each command or agency responsibilities.

A2.4.4. Training System Management and Support Concept. Concurrency must be given a primary consideration in contracting. Identify the concept and strategy for achieving cradle-to-grave management and support of the training system. Describe requirements and options for logistics support. CLS contracts that include modifications (hardware/software) should be developed and used. Consider:

A2.4.4.1. Contractor logistics support and management.

A2.4.4.2. Technical data.

A2.4.4.3. Spares.

A2.4.4.4. Consumables.

A2.4.4.5. Organizational, intermediate, and depot level maintenance.

A2.4.4.6. Special or system operational equipment.

A2.4.4.7. Common or special tools and equipment.

A2.4.5. Manpower Support Concept, Military Personnel Utilization Concept, and Personnel Training Requirements. Consider student demographics, entry requirements, and student throughput estimates; estimate portion of military, civilian, or contract personnel. Describe Air Force specialty codes (AFSC) employed. Identify these and any other unique requirements for this system in each of the following functional areas:

A2.4.5.1. Combined test force.

A2.4.5.2. Initial cadre instructors.

A2.4.5.3. Operations.

A2.4.5.4. Maintenance.

A2.4.5.5. Depot.

A2.4.5.6. Security forces.

A2.4.5.7. Munitions and explosive ordnance.

A2.4.5.8. Contractor support/CLS/CT/ATS.

A2.4.6. Training Constraints and Risks. Include all potential limitations that will or may affect timely implementation of training objectives to meet mission IOC and maintain full operational capability (FOC). Describe all peacetime training constraints. Consider manpower or personnel and resource availability, safety, security, cost, and environmental considerations, which may influence training media and methodology design, development, and selection. Include peacetime restrictions on the use of the defense system. Identify risks and assign risk levels that may affect deployment schedules or other milestones. Identify the expected impact of late to need or unusable training devices in terms of work-a-rounds, dollar costs for alternative training, increased use of the defense system, or impact of failure to perform on combat capability. Initiatives such as advanced defense system design change data deliveries and long-lead contractor provided equipment or Government-furnished equipment, information, or property should be considered. The risk Government-furnished property adds to a concurrent delivery schedule must be discussed and tradeoffs identified.

A2.5. Defense and Training System Milestones. Identify the defense system and training system schedules and priority ratings necessary for concurrency required to deliver the training system by the TND. Show need dates in terms of milestones. The key to concurrency at major transition points is active, flexible, and innovative anticipation and cooperation of the command with program management responsibility and participating and operating commands. Include description of disciplined change process, key engineering change proposals, and management responsibility and operational milestones. Consider all schedules pertinent to satisfying training objectives through definitive milestones. These could include:

A2.5.1. Operational system major milestones to include IOC through FOC.

A2.5.2. Task requirements and analyses completion dates.

A2.5.3. Training equipment requirements and delivery.

A2.5.4. Facility beneficial occupancy dates.

A2.5.5. System deployment contract dates.

A2.5.6. Training system support center activation.

A2.5.7. Factory or contractor training dates.

A2.5.8. Instructional course start dates.

A2.5.9. Logistics support requirements dates.

A2.5.10. TNDs, ready for training, and RAA dates.

A2.5.11. Technical data availability.

A2.5.12. Courseware development completion dates.

A2.5.13. Training management system completion dates.

A2.5.14. Training system evaluation plan and review dates.

A2.6. Resource Summary. Identify total resource requirements to develop and operate the training system throughout the weapon system life cycle. Include recommended tradeoffs to support training system and impact of not funding or procuring desired training capability.

A2.6.1. Funds. Indicate funding as follows:

Program Element:	XXXXX						
Item Required	Appropriation	FY	FY	FY	FY	FY	FY
Training Devices	3010	—	—	—	—	—	—
Other Procurement	3080	—	—	—	—	—	—
Type 1 Training	3400	—	—	—	—	—	—
Military Personnel	3500	—	—	—	—	—	—
Technical Need	3600	—	—	—	—	—	—

A2.6.2. Training or test equipment, hardware, courseware, firmware, training aids, technical manuals, and documentation:

A2.6.2.1. Types.

A2.6.2.2. Numbers.

A2.6.2.3. Life-cycle support.

A2.6.3. Manpower:

A2.6.3.1. Officer.

A2.6.3.2. Enlisted.

A2.6.3.3. Civilian.

A2.6.4. Personnel:

A2.6.4.1. Instructor cadre.

A2.6.4.2. Support personnel.

A2.6.5. Military construction or facility modification. Describe project and costing by fiscal year. Establish physical, environmental, power, safety, security, etc., requirements.

A2.6.5.1. Facility requirements.

A2.6.5.2. Furniture, audiovisual, etc., requirements.

A2.6.5.3. Security.

A2.6.6. Contractor support. Time, effort, and cost. Initial training support.

A2.6.7. Travel and per diem.

A2.6.8. Other. Airspace, ranges, flying hours, munitions, etc.

A2.7. Training Validation and Evaluation. Develop validation/evaluation criteria, methodology, and responsibilities. Provide cost benefit analysis of proposed alternatives. Include plan for evaluation of training effectiveness.

A2.8. Future R&D Efforts. Describe future R&D studies and cost benefit analysis which may support upgrades to the systems or alternative methodologies to close any training gaps or accomplish the training with fewer resources.

A2.9. Lessons Learned. Address how program will benefit from previous or other ongoing programs.

A2.9.1. List lessons learned data base programs.

A2.9.2. Identify problem areas common with other programs and potential solutions.

A2.9.3. Document fixes, work-a-rounds, or changes to requirements based on lessons learned. Include impact on system costs, effectiveness, and combat capability.

A2.10. Distribution. Include appropriate distribution to members of the training planning team and other designated agencies.

Attachment 3

TRAINER FABRICATION ORGANIZATIONS CAPABILITIES

A3.1. 4444 Operations Squadron/Training Systems Center, Luke AFB AZ 85309-5000. Design, build, program and provide life-cycle support for a wide variety of static and computerized defense system trainers.

A3.2. ASC/AMF (DMMF), Wright-Patterson AFB OH 45433-6513. Major aircraft design and modification, aerospace job shop, broad ability to design or manufacture a variety of aerospace and ground support items.

A3.3. 30 Operations Support Squadron/DOOS Vandenberg AFB CA 93437-5232. Small shop, woodworking, machine, sheet metal, electrical, drafting capabilities.

A3.4. 330 Training Management Squadron/MAV, Keesler AFB MS 39534-2449. Design, fabricate, modify training systems and computer embedded simulators for US Air Force.

A3.5. 12 MS/LGMD, Randolph AFB TX 78150-4515. Design and fabricate electromechanical training devices to support US Air Force training.

A3.6. 82 Logistic Support Squadron/LGMT, Sheppard AFB, TX 76311-2551. Design and fabricate electrical, electronic, pneumatic, hydraulic and mechanical units.

A3.7. 58 Operations Group/DOTA, Kirtland AFB NM 87117-5821. Develop and support training devices for US Air Force Helicopter, Pararescue, and HC-130 formal courses.

Attachment 4

AIRCREW TRAINING DEVICE (ATD) CATEGORIES

The following major Air Force ATDs have been initially categorized.

DEVICE	ATD	DESCRIPTION
A-7D CFT	TBD	Cockpit Familiarization Trainer
A-10 CPT	AST	Cockpit Procedures Trainer
B-1 CPT	LEVEL 6	Cockpit Procedures Trainer
B-1 MT	LEVEL 6	Mission Trainer
B-1 WST FS	LEVEL B	Weapons System Trainer, Flight Station
B-1 WST DS	LEVEL 6	Weapons System Trainer, Defensive Station
B-2 CPT	OTHER	Cockpit Procedures Trainer
B-2 MT	TBD	Mission Trainer
B-2 WST	TBD	Weapons System Trainer
B-52G/H ARPTT	LEVEL A	Air Refueling Part Task Trainer
B-52G/H CPT	LEVEL 4	Cockpit Procedures Trainer
B-52G/H DS	LEVEL 4	Defensive Station
B-52G/H OS	LEVEL 4	Offensive Station
B-52G/H OSMT	LEVEL 4	Offensive Systems Mission Trainer
B-52G/H T4 EWS	LEVEL 4	Electronic Warfare Station
B-52G/H WST	LEVEL B	Weapons System Trainer
C-130 CPT	LEVEL 4	Cockpit Procedures Trainer
C-130E/H OFT	LEVEL B	Operational Flight Trainer
C-135 WST	LEVEL 5	At McClellan
C-141 ARPTT	LEVEL 4	Air Refueling Part Task Trainer
C-141 CPT	LEVEL 4	Cockpit Procedures Trainer
C-141 LT	AST	Load Trainer
C-141 OFT	LEVEL 5	Operational Flight Trainer
C-141 WST(E2)	LEVEL C	ESIG 200 visual
C-141 WST(E6)	LEVEL C	ESIG 600 visual
C-17 WST	LEVEL C	Weapons System Trainer (Pending)
C-5 ARPTT	LEVEL 4	Air Refueling Part Task Trainer
C-5 CL	AST	Cargo Loader
C-5 CPT	LEVEL 4	Cockpit Procedures Trainer
C-5 DT	AST	Door Trainer
C-5 WST(PT)	LEVEL C	PT 2000 visual
C-5 WST(SP1)	LEVEL C	Weapon System Trainer, SP1 visual

DEVICE	ATD	DESCRIPTION
E-3 CPT	LEVEL 4	Cockpit Procedures Trainer
E-3 MT	TBD	Mission Trainer
E-3 NPTT	LEVEL 4	Navigator Part Task Trainer
E-3 OFT #1	LEVEL C	Operational Flight Trainer
E-3 OFT #2	LEVEL B	Operational Flight Trainer
EC-130 MT	TBD	Mission Trainer
EF-111 OFT	LEVEL 6	Operational Flight Trainer
F-111E OFT	LEVEL 6	Operational Flight Trainer
F-111F OFT	LEVEL 6	Operational Flight Trainer
F-117A PTT	LEVEL 4	Part Task Trainer
F-117A WST	LEVEL 6	Weapons System Trainer
F-15 AIT	LEVEL 4	Air Intercept Trainer
F-15 LPTT	AST	LANTIRN Part Task Trainer
F-15A/C OFT	LEVEL 5	Operational Flight Trainer
F-15 PTT	LEVEL 5	Part Task Trainer (ANG)
F-15 WTT	TBD	Weapons Tactics Trainer
F-15E WST	LEVEL 5	Weapons System Trainer
F-16 AIT	LEVEL 4	Air Intercept Trainer
F-16 LPTT	AST	LANTIRN Part Task Trainer
F-16 PTT	LEVEL 5	Part Task Trainer (ANG)
F-16-10 OFT	LEVEL 5	Operational Flight Trainer
F-16-30 WST	LEVEL 5	Weapons System Trainer
F-16-40 WST	LEVEL 6	Weapons System Trainer
F-16-50 WST	LEVEL 6	Weapons System Trainer
F-16 ADF OFT	LEVEL 5	Air Defense Fighter Operational Flight Trainer
F-22	TBD	
F-4C WST	LEVEL 6	Weapons System Trainer
F-4C/E CFT	AST	Cockpit Familiarization Trainer
F-4G TWSA	LEVEL 6	Trainer Weapon System Aircraft
HC-130P WST	LEVEL C	Weapons System Trainer, not accepted yet
JPATS	TBD	
KC-10 BOT	LEVEL 4	Boom Operator Trainer
KC-10 CPT	LEVEL 4	Cockpit Procedures Trainer
KC-10 WST	LEVEL B	Weapons System Trainer
KC-135 OFT	LEVEL 4	Operational Flight Trainer
KC-135 WST	LEVEL 5	Weapons System Trainer
KC-135 WST NAV	LEVEL 4	Weapons System Trainer, Navigator

DEVICE	ATD	DESCRIPTION
MC-130	TBD	
MH-53J PTT	LEVEL 5	Part Task Trainer
MH-53J WST	LEVEL C	Weapons System Trainer
MH-60 OFT	LEVEL 7	Operational Flight Trainer, not accepted yet
MH-60 WST	LEVEL C	Weapons System Trainer
RC-135 OFT	LEVEL B	Operational Flight Trainer
RF-4E WST	LEVEL 6	Weapons System Trainer
SAAC	LEVEL 6	Simulator for Air-to-Air Combat (R&D/Training)
SECT	TBD	Simulator for Electronic Combat
T-1 CPT	OTHER	Cockpit Procedures Trainer
T-1 TFS	LEVEL 7	Trainer, Flight Simulator
T-37 CPT	OTHER	Cockpit Procedures Trainer
T-37 IFS	LEVEL 6	Instrument Flight Simulator
T-37 TFS	LEVEL 6	Trainer, Flight Simulator
T-38 CPT	OTHER	Cockpit Procedures Trainer
T-38 IFS	LEVEL 6	Instrument Flight Simulator
T-38 TFS	LEVEL 6	Trainer, Flight Simulator
T-40 IFT	LEVEL 4	Instrument Flight Trainer
T-43 NAV	LEVEL 4	Navigator Trainer
TH-53 OFT	LEVEL C	Operational Flight Trainer
U-2	TBD	

Attachment 5

**ATD TRAINING TASKS FOR AIRCREW QUALIFICATIONS AFTER BASIC QUALIFICA-
TION TRAINING (POST SUPT FOR PILOTS)**

Tables are established for the following fixed wing aircraft qualifications:

Table 1--Initial/Continuation/Upgrade Training for Pilots

Table 2--Initial/Continuation/Upgrade Training for Engineers

Table 3--Initial/Continuation/Upgrade Training for Boom Operators

Table 4--Initial/Continuation/Upgrade Training for Navigators, Weapon System

Operators, Electronic Warfare Officers

Tables are established for the following helicopter qualifications:

Table 5--Initial/Continuation/Upgrade Training for Pilots

Table 6--Initial/Continuation/Upgrade Training for Engineers

Table 7--Initial/Continuation/Upgrade Training for Gunners

There are three codes used to denote the level of training provided by ATDs. The code will identify the lowest level device that can train the specified task. Inflight emergency training will be "simulated". "S" denotes training performed on the particular ATD is to syllabus standards (less than flight proficiency) and requires certification of the device to train the task ; "X" denotes training performed on the particular ATD is to flight proficiency standards; "O" identifies the tasks not trainable in an aircraft because of safety considerations.

NOTES:

1. The following ATD training charts include training tasks that require fidelity tolerances based on subject matter experts (SME) and in general, extend Federal Aviation Administration (FAA) ATD fidelity tolerances to USAF unique tasks. Additional fidelity requirements beyond FAA established limits still need to be defined.

2. While completing the ISD process and developing the STP, the following charts should be used as guides to help determine the proper ATD mix. Because industry will be using these tables and standard ATD terminology in building ATDs, users must minimize changes to these tables to help streamline the acquisition and certification process. Delete tasks from the task list when not applicable for a specific weapon system (e.g. there are no guns employment tasks for C-141s, and there are no two-engine inoperative approaches for F-16s).

3. While ATDs can effectively train many individual tasks to proficiency, only after all the factors of a demanding mission profile are combined in a realistic environment is an individual able to truly train those tasks and prepare himself or herself for war.

4. When a visual system must exceed the minimum established for ATDs in order to train a particular task, the size and fidelity will be noted. For Level A and B simulators the minimum visual is 45 degrees horizontal by 30 degrees vertical field of view for each pilot station, night visual. For Level C simulators the minimum visual is 75 degrees horizontal by 30 degrees vertical for each

pilot station, night and dusk visual. For Level D simulators the minimum visual is 75 degrees horizontal by 30 degrees vertical for each pilot station, night, daylight and dusk visual.

5. These charts apply to major weapon system training (e.g. C-141, F-15E, etc.) which follows general crew training (e.g. SUPT for pilots, or basic flight engineer training for engineers).

Table A5.1. Initial/Continuation/Upgrade Training for Pilots. Fixed Wing Aircraft Qualifications

FLIGHT PHASE	TRAINING EVENT	AST	FTD LEVEL 4	FTD LEVEL 5	FTD LEVEL 6	FTD LEVEL 7	SIM A	SIM B	SIM C	SIM D	ACFT
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S		X						X
	Performance Limitations		X								X
SURFACE OPERATION	Pushback				S				X(1)		X
	Powerback Taxi				S(2)				X(1)		X
	Starting		S		X						X
	Taxi				S(2)				X(1)		X
	Pretakeoff Checks		S		X						X
TAKEOFF	Normal			S(2)					X(1)		X
	Crosswind			S(2)					X(1)		X
	Rejected			S(2)				X			O
	Power Failure			S(2)					X		O
CLIMB	Normal			S				X			X
	One-engine Inoperative During Climb			S				X			X
	Two-engine Inoperative During Climb			S				X			O
EN ROUTE	Unusual Attitudes				S(2)			X			O(3)
	Approach to Stalls						S		X		O(3)
	Inflight Engine Shutdown		S						X		X
	Inflight Engine Restart		S		X						X
	High Speed Handling Characteristics				S(2)				X		X
	Low Speed Handling Characteristics				S(2)				X		X

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[1] Requires visual system

[2] Requires wide-angle daylight, dusk, night visual

[3] Requires further study

[4] Requires wide-angle daylight, dusk, night visual with independently moving models controlled by an instructor or follow pre-defined motion path

[5] Requires wide-angle daylight, dusk, night visual and a minimum of 2 ATDs connected/operating together in real time

		AST	FTD LEVEL		SIMULATOR LEVEL			ACFT
DESCENT	Normal			S	X			X
	Maximum Rate			S	X			X
APPROACHES	**VFR Procedures**							
	Visual Straight-in Approach			S(2)		X(1)		X
	Overhead Pattern			S(2)		X(1)		
	With One-engine Inop			S(2)	X			X
	With Two-engines Inop			S(2)	X			X
	With Slat/Flap Malfunction			S(2)	X			X
	IFR Precision Approaches							
	CAT III					S	X	X
	ILS/Normal			S	X			X
	ILS/One-engine Inoperative			S	X			X
	ILS/Two-engines Inoperative			S	X			X
	PAR/Normal			S	X			X
	PAR/One-engine Inoperative			S	X			X
	PAR/Two-engines Inoperative			S	X			X
	IFR Nonprecision Approaches							
	TACAN/Normal			S	X			X
	NDB/Normal			S	X			X
	VOR/Normal			S	X			X
	Nonprecision App One-engine Inop			S		X		X
	Nonprecision App Two-engines Inop			S		X		X
	LOC Backcourse Procedures			S	X			X
	SDF/LDA Procedures			S	X			X
	ASR Procedures			S	X			X
	RNAV Procedures			S	X			X
	Circling Approach			S(1)		X(2)		X
	Missed Approaches							
	From Precision Approach			S	X			X
	From Nonprecision Approach		S		X			X
	With Engine Failure		S			X		X
LANDINGS	Normal			S(1)		X(2)		X

Category	Item	AST	AST	FTD	FTD	SIM	SIM	SIM	ACFT
	Short Field (Maximum Effort)				S(1)		X(2)		X
	With Pitch Mistrim				S(1)		X(2)		X
	From Precision Approach				S(1)		X(2)		X
	From Precision App One-engine Inop				S(1)		X(2)		X
	From Precision App Two-engines Inop				S(1)		X(2)		X
	With Flap/Slat Malfunction				S(1)		X(2)		X
	Crosswind				S(1)			X(2)	X
AFTER LANDING	Parking						X(2)		X
	Emergency Evacuation	S				X			X
	Post Flight Visual Inspection	S							X
FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			S		X			X
	Ice Accumulation on Airframe			S			X		O
	Air Hazard Avoidance				S(1)		X(2)		O
	Windshear/Microburst				S			X	O
	Air Refueling				S(1)			X(2)	X
	Ejection/Bailout			S		X			O
	GCI/AWACS/ABCCC Procedures			S		X			X
	Formation Flying (3)				S(4)		X(5)		X
	Air Drop Procedures (3)						X(5)		X
	Night Vision Device Use				S(1)			X	X
	Cargo/Passenger Handling		S						X
	Offensive Operations								
	Navigation System Operations			S	X				X
	Radar Scope Interpretation			S	X				X
	Low Altitude Safety and Targeting Enhancement (LASTE)/LOWAT(1)				S(2)				X
	Terrain Following/Avoidance(1)				S		X(3)		X
	Fighter Intercept Exercises(1)				S(2)				X
	Basic Fighter Maneuvers(1)				S(2)				X
	Air Combat Maneuvers(1)				S(2)				X

		AST	FTD LEVEL			SIMULATOR LEVEL				ACFT
	Defensive Operations									
	Electronic Counter Measures									
	Ground Based Threats				S					O
	Airborne Threats				S(2)					O
	Chaff and Flare Usage				S					X
	Defensive Action Maneuvers(1)				S(2)					X
	Emissions Control Training				S					X
	Weapons Employment									
	Air-to-Air									
	Targeting Systems Operations(1)				S(2)					X
	Guns Employment(1)				S(2)					X
	Missile Employment(1)				S(2)					X
	Air-to-Ground									
	Bombing System Operations(1)				S(2)					X
	Conventional Weapon Employ(1)				S(2)					X
	Nuclear Weapon Employment(1)				S(2)					X
SYSTEMS PROCEDURES DURING ANY PHASE	Pneumatic/Pressurization	S			X					O
	Air Conditioning	S			X					O
	Fuel and Oil	S			X					O
	Electrical	S			X					O
	Hydraulic	S			X					O
(Normal)	Flight Controls	S			X					O
(Abnormal)	Anti-icing and Deicing System	S			X					O
(Alternate)	Autopilot			S	X					O
(Emergency)	Flight Management Guidance Systems			S	X					O
	Approach and Landing Aids			S	X					O
	Stall Warning/Avoidance Devices			S	X					O

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[1] Requires further study

[2] Requires visual system

[3] Requires wide-angle daylight, dusk, night visual

	AST	FTD LEVEL			SIMULATOR LEVEL					ACFT
Stability Augmentation Systems			S	X						O
Airborne Weather Radar	S			X						O
Flight Instrument System	S			X						O
Navigation System/GPS	S			X						O
Aircraft Fires		S		X						O
Smoke Control		S		X						O
Engine		S		X						O
Fuel Jettison		S		X						O
Landing Gear		S		X						O
Flap System		S		X						O
Ejection/Bailout		S		X						O
Communications Equipment										
UHF/VHF/HF/FM	S			X						X
Secure Voice	S			X						X
Have Quick	S			X						X
AFSATCOM	S			X						X
GCI/AWACS/ABCCC Procedures	S			X						X

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[1] Requires wide-angle daylight, dusk, night, visual

[2] Aircraft specific

Table A5.2. Initial/Continuation/Upgrade Training for Engineers. Fixed Wing Aircraft Qualifications

		AST	4	5	FTD LEVEL 6	7	A	B	SIMULATOR LEVEL C	D	ACFT
FLIGHT PHASE	TRAINING EVENT										
PREPARA-TION	Preflight Visual Inspection				S						X
	Prestart Procedures		S	X							X
	Performance Limitations		X								X
SURFACE OPERATION	Pushback				S				X(1)		X
	Powerback Taxi				S				X(1)		X
	Starting		S		X						X
	Taxi				S				X(1)		X
	Pretakeoff Checks		S	X							X
TAKEOFF	Normal				X						X
	Crosswind				X						X
	Rejected				X						O
	Power Failure				X						O
CLIMB	Normal				X						X
	One-engine Inoperative During Climb				X						X
	Two-engine Inoperative During Climb				X						O
EN ROUTE	Unusual Attitudes				X						O(2)
	Approach to Stalls				X						O(2)
	Inflight Engine Shutdown		X								X
	Inflight Engine Restart		X								X
	High Speed Handling Characteristics								X		X
	Low Speed Handling Characteristics								X		X
DESCENT	Normal				X						X
	Maximum Rate				X						X

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[1] Requires wide-angle daylight, dusk, night visual

[2] Aircraft specific

		AST		FTD LEVEL			SIMULATOR LEVEL		ACFT
APPROACHES	**VFR/IFR Procedures**								
	Normal Approach			X					X
	With One-engine Inop			X					X
	With Two-engines Inop			X					X
	With Slat/Flap Malfunction			X					X
	CAT II/III			X					X
	Missed Approaches								
	Normal			X					X
	With Engine Failure			X					X
LANDINGS	Normal			X					X
	Short Field (Maximum Effort)			X					X
	With Pitch Mistrim			X					X
	With Flap/Slat Malfunction			X					X
	Crosswind			X					X
AFTER LANDING	Parking							X(1)	X
	Emergency Evacuation	S					X		X
	Post Flight Visual Inspection				S				X
FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X					X
	Ice Accumulation on Airframe	S				X			O
	Air Hazard Avoidance				S			X(1)	O
	Windshear/Microburst			X					O
	Air Refueling		S				X		X
	Ejection/Bailout			S			X		O
	GCI/AWACS/ABCCC Procedures			X					X
	Air Drop Procedures			X					X
	Night Vision Device Use				S(2)			X	X
SYSTEMS	Pneumatic/Pressurization	S		X					O

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[1] Requires wide-angle daylight, dusk, night visual

[2] Requires visual system

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		AST			FTD LEVEL	SIMULATOR LEVEL					ACFT
PROCEDURES DURING ANY PHASE	Air Conditioning	S			X						O
	Fuel and Oil	S			X						O
	Electrical	S			X						O
	Hydraulic	S			X						O
(Normal)	Flight Controls	S			X						O
(Abnormal)	Anti-icing and Deicing System	S			X						O
(Alternate)	Autopilot			S	X						O
(Emergency)	Flight Management Guidance Systems			S	X						O
	Approach and Landing Aids			S	X						O
	Stall Warning/Avoidance Devices			S	X						O
	Stability Augmentation Systems			S	X						O
	Airborne Weather Radar	S			X						O
	Flight Instrument System	S			X						O
	Navigation System/GPS	S			X						O
	Aircraft Fires		S		X						O
	Smoke Control		S		X						O
	Engine		S		X						O
	Fuel Jettison		S		X						O
	Landing Gear		S		X						O
	Flap System		S		X						O
	Ejection/Bailout		S		X						O
	Communications Equipment										
	UHF/VHF/HF/FM	S			X						X
	Secure Voice	S			X						X
	Have Quick	S			X						X
	AFSATCOM	S			X						X
	GCI/AWACS/ABCCC Procedures	S			X						X

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[1] Requires wide-angle daylight, dusk, night visual

[2] Requires visual system

Table A5.3. Initial/Continuation/Upgrade Training for Boom Operators. Fixed Wing Aircraft Qualifications

		AST	FTD LEVEL				SIMULATOR LEVEL				ACFT
			4	5	6	7	A	B	C	D	
FLIGHT											
PHASE	TRAINING EVENT										
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S	X							X
	Performance Limitations		X								X
SURFACE	Starting		S		X						X
OPERATION	Taxi				S				X		X
	Pretakeoff Checks		S	X							X
TAKEOFF	Normal			X							X
CLIMB	Normal			X							X
DESCENT	Normal			X							X
LANDINGS	Normal			X							X
AFTER	Parking								X(1)		X
LANDING	Emergency Evacuation	S						X			X
	Post Flight Visual Inspection				S						X
FLIGHT	Ice Accumulation on Airframe	S				X					O
PROCEDURES	Air Refueling(3)		S								X
DURING ANY	Ejection/Bailout			S				X			O
AIRBORNE	GCI/AWACS/ABCCC Procedures			X							X
PHASE	Formation Flying(3)			X							X
	Night Vision Device Use				S(2)				X		X
	Cargo/Passenger Handling				X						X
	Navigation System Operation			S							X
SYSTEMS	Pneumatic/Pressurization	S			X						O
PROCEDURES	Air Conditioning	S			X						O

		AST	FTD LEVEL			SIMULATOR LEVEL					ACFT
DURING ANY	Fuel and Oil	S			X						O
PHASE	Electrical	S			X						O
	Hydraulic	S			X						O
(Normal)	Flight Controls	S			X						O
(Abnormal)	Anti-icing and Deicing System	S			X						O
(Alternate)	Flight Management Guidance Systems			S	X						O
(Emergency)	Stall Warning/Avoidance Devices			S	X						O
	Navigation System/GPS			S	X						O
	Aircraft Fires		S		X						O
	Smoke Control		S		X						O
	Engine		S		X						O
	Fuel Jettison		S		X						O
	Landing Gear		S		X						O
	Flap System		S		X						O
	Ejection/Bailout		S		X						O
	Cargo/Passenger Handling										X
	Communications Equipment										
	UHF/VHF/HF/FM	S			X						X
	Secure Voice	S			X						X
	Have Quick	S			X						X
	AFSATCOM	S			X						X
	GCI/AWACS/ABCCC Procedures	S			X						X

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[1] Requires wide-angle daylight, dusk, night visual

[2] Requires a visual system

[3] Requires further study

Table A5.4. Initial/Continuation/Upgrade Training for Navigators, Weapon System Operators, Electronic Warfare Officers. Fixed Wing Aircraft Qualifications

FLIGHT PHASE	TRAINING EVENT	AST	FTD LEVEL 4	5	6	7	SIMULATOR LEVEL A	B	C	D	ACFT
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S		X						X
SURFACE OPERATION	Starting		S		X						X
	Taxi				S						X
	Pretakeoff Checks		S		X						X
TAKEOFF	Normal		S		X						X
CLIMB	Normal		S		X						X
EN ROUTE	Navigation		S		X						X
DESCENT	Normal		S		X						X
APPROACHES	**VFR Procedures**										
	Normal				X(1)						X
	IFR Precision Approaches										
	Normal				X						X
	IFR Nonprecision Approaches										
	Airborne Radar Directed Approach				S				X		X
	Missed Approaches										
	Normal				X						X

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[1] Requires daylight, dusk, night visual for crew position

[2] Requires wide-angle daylight, dusk, night visual

[3] Requires further study

		AST	FTD LEVEL			SIMULATOR LEVEL					ACFT
LANDINGS	Normal				X						X
AFTER LANDING	Parking		S						X(2)		X
	Emergency Evacuation	X									X
	Post Flight Visual Inspection				S(1)						X
FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding				X						X
	Air Hazard Avoidance				S						X
	Air Refueling				S						X
	Ejection/Bailout				S						O
	GCI/AWACS/ABCCC Procedures				S						X
	Formation Flying(1)				S						X
	Air Drop Procedures(1)								X(2)		X
	Night Vision Device Use				S						X
	Offensive Operations										
	Navigation System Operations		S		X						X
	Radar Scope Interpretation				S						X
	Terrain Following/Avoidance(1)				S(3)				X(4)		X
	Fighter Intercept Exercises(1)				S(3)						X
	Basic Fighter Maneuvers(1)				S(3)						X
	Air Combat Maneuvers(1)				S(3)						X
	Defensive Operations										
	Electronic Counter Measures										
	Ground Based Threats				S						O
	Airborne Threats				S(3)						O
	Chaff and Flare Usage				S						X
	Defensive Action Maneuvers(1)				S(3)						X
	Emissions Control Training				S						X
	Weapons Employment										
	Electronic Warfare Operations(1)				S						O
	Air-to-Air										
	Targeting Systems Operations(1)				S(3)						X
	Guns Employment(1)				S(3)						X

		AST	FTD LEVEL			SIMULATOR LEVEL					ACFT
	Missile Employment(1)				S(3)						X
	Air-to-Ground										
	Bombing System Operations(1)				S(3)						X
	Conventional Weapon Employ(1)				S(3)						X
	Nuclear Weapon Employment(1)				S(3)						X
SYSTEMS	Flight Management Guidance Systems			S	X						O
PROCEDURES	Airborne Weather Radar	S			X						O
DURING ANY	Flight Instrument System	S			X						O
PHASE	Navigation System/GPS	S			X						O
	Aircraft Fires		S		X						O
(Normal)	Smoke Control		S		X						O
(Abnormal)	Engine		S		X						O
(Alternate)	Ejection/Bailout		S		X						O
(Emergency)											
	Communications Equipment										
	UHF/VHF/HF/FM	S			X						X
	Secure Voice	S			X						X
	Have Quick	S			X						X
	AFSATCOM	S			X						X
	GCI/AWACS/ABCCC Procedures	S			X						X

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[2] Requires wide-angle daylight visual and a minimum of 2 ATDs connected/operating together in real time

[3] Requires visual system for the crew position

[4] Requires wide-angle daylight visual

Table A5.5. Initial/Continuation/Upgrade Training for Pilots. Helicopter Qualifications

FLIGHT PHASE	TRAINING EVENT	AST	4	5	6	7	A	B	C	D	ACFT
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S		X						X
	Performance Limitations		X								X
SURFACE OPERATION	Starting		S		X						X
	Ground Taxi								S(1)		X
	Hovering Taxi								S(1)		X
	Pretakeoff Checks		S		X						X
TAKEOFF	Normal					S(1)			X		X
	Marginal Power								X		X
	Maximum Performance								X		X
	Running								X		X
	Crosswind								X		X
	Remote Site								S(1)		X
CLIMB	Normal								X		X
	One-engine Inoperative During Climb								X		X
EN ROUTE	Unusual Attitudes								X		X
	Inflight Engine Shutdown		S		X						X
	Inflight Engine Restart		S		X						X
	High Speed Handling Characteristics								X		X
	Low Speed Handling Characteristics								X		X
DESCENT	Normal								X		X
	Maximum Rate								X		X
APPROACHES	**VFR Procedures**										
	Traffic Pattern								X(1)		X
	Normal								X		X
	Shallow								X		X
	Steep								X		X

	AST			FTD LEVEL			SIMULATOR LEVEL		ACFT
Turning								S(1)	X
With One-engine Inop (Marginal Power)								X	X
AFCS Off								X	X
Autorotation - Straight								S	X
Autorotation - Turning								S(1)	X
Hover Coupler								X	X
Remote Site								S(1)	X
Tactical								S(1)	X
IFR Precision Approaches									
ILS/Normal								X	X
ILS/One-engine Inoperative								X	X
PAR/Normal								X	X
PAR/One-engine Inoperative								X	X
IFR Nonprecision Approaches									
TACAN/Normal								X	X
NDB/Normal								X	X
VOR/Normal								X	X
Nonprecision App One-engine Inop								X	X
RNAV Procedures								X	X
Circling Approach								X(1)	X
LOC Backcourse Procedures								X	X
Missed Approaches									
From Precision Approach								X	X
From Nonprecision Approach								X	X
With Engine Failure								X	X
Holding								X	X
LANDINGS — Normal								S(1)	X
Running								X(1)	X
Remote Site								S(1)	X
From Precision Approach								X(1)	X
From Precision App One-engine Inop								X(1)	X

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1 Requires wide-angle daylight, dusk, night visual

Category	Task	AST	FTD LEVEL	SIMULATOR LEVEL		ACFT
	With Flap/Slat Malfunction				X(1)	X
	Crosswind				X(1)	X
AFTER LANDING	Parking				X(1)	X
	Emergency Evacuation	S		X		X
	Post Flight Visual Inspection		S			X
OPERATIONAL FLIGHT PROCEDURES (DAY, NIGHT, NVG)	Remote High Recon				X(1)	X
	Remote Low Recon				X(1)	X
	Land Hoist				S(1)	X
	Cargo Sling				S(1)	X
	Ditching				S	O
	Water Hoist				S(1)	X
	Alternate Insertion/Extraction				S(1)	X
	Swimmer Deployment				S(1)	X
	Personnel Parachute Drop				S	X
	VFR Navigation				S(1)	X
	Visual Search				S(1)	X
	Electronic Search				X	X
	Smoke/Flare Deployment				S(1)	X
	Tactical Operations					
	Navigation System/Map Interpretation				S(1)	X
	Terrain Following/Avoidance				S(1)	X
	Formation Flying				S(2)	X
	Aerial Refueling				S(1)	X
	Weapons Employment				S(1)	X
	PAVE LOW Night Mountain				S	X
	Mission Rehearsal				X(1)	X
	Defensive Operations					
	Threat Identification				S(1)	X
	Threat Avoidance				S(1)	O
	Evasive Maneuvering				S(1)	X
	Electronic Counter Measures					
	Ground Based Threats				S(1)	O
	Airborne Threats				S(1)	O
	Chaff and Flare Usage				X	O
	Emissions Control Training				X	O

		AST	FTD LEVEL		SIMULATOR LEVEL	ACFT
SYSTEMS	Rotor/Transmission/Tail Rotor	S			X(1)	O
PROCEDURES	AFCS	S			X	O
DURING ANY	Fuel and Oil	S			X	O
PHASE	Electrical	S			X	O
	Hydraulic	S			X	O
(Normal)	Flight Controls	S			X(1)	O
(Abnormal)	Anti-icing and Deicing System	S			X	O
(Alternate)	TF/TA Radar		S	X		O
(Emergency)	Flight Management Guidance Systems		S	X		O
	Approach and Landing Aids		S	X		O
	FLIR		S	X		O
	Airborne Weather Radar	S		X		O
	Flight Instrument System	S		X		O
	Navigation System/GPS	S		X		O
	Aircraft Fires		S		X	O
	Smoke Control		S	X		O
	Engine		S		X	O
	Fuel Jettison		S	X		O
	Landing Gear		S	X		O
	Bailout		S	X		O
	Communications Equipment					
	UHF/VHF/HF/FM	S		X		X
	Secure Voice	S		X		X
	Have Quick	S		X		X
	AFSATCOM	S		X		X
	GCI/AWACS/ABCCC Procedures	S		X		X

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[1] Requires wide-angle daylight visual

[2] Requires wide-angle daylight visual and a minimum of 2 ATDs connected/operating together in real time

Table A5.6. Initial/Continuation/Upgrade Training for Engineers. Helicopter Qualifications

		AST	FTD LEVEL				SIMULATOR LEVEL				ACFT
			4	5	6	7	A	B	C	D	
FLIGHT PHASE	TRAINING EVENT										
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S		X						X
	Performance Limitations		X								X
SURFACE OPERATION	Starting		S		X						X
	Ground Taxi		S		X						X
	Hovering Taxi		S		X						X
	Pretakeoff Checks		S		X						X
TAKEOFF	Normal			X							X
	Marginal Power			X							X
	Maximum Performance			X							X
	Running			X							X
	Crosswind			X							X
	Remote Site			X							X
CLIMB	Normal			X							X
	One-engine Inoperative During Climb			X							X
EN ROUTE	Normal				S				X		X
	Inflight Engine Shutdown		S		X						X
	Inflight Engine Restart		S		X						X
DESCENT	Normal			X							X
	Maximum Rate			X							X
APPROACHES	**VFR Procedures**										
	Normal		S		X				X		X
	With One-engine Inop (Marginal Power)		S						X		X
	AFCS Off				S				X		X
	Autorotation - Straight				S(1)				X		X
	Autorotation - Turning				S(1)				X		X
	Hover Coupler								X		X
	Remote Site				S(1)				X(2)		X

		AST	FTD LEVEL	SIMULATOR LEVEL	ACFT
	Tactical		S(1)	X(2)	X
	IFR Precision/Nonprecision App				
	Normal		X		X
	One-engine Inoperative		X		X
	Missed Approaches				
	Normal		X		X
	With Engine Failure		X		X
LANDINGS	Normal		S(1)	X	X
	Running		S(1)	X	X
	Remote Site		S(1)		X
	Crosswind		S(1)	X	X
AFTER LANDING	Parking			X	X
	Emergency Evacuation	S		X	X
	Post Flight Visual Inspection		S		X
OPERATIONAL FLIGHT PROCEDURES (DAY, NIGHT, NVG)	Remote High Recon			X	X
	Remote Low Recon			X	X
	Land Hoist Day/Night			S(2)	X
	Cargo Sling			S(2)	X
	Ditching		S		O
	Water Hoist Day/Night			S	X
	Alternate Insertion/Extraction			S(2)	X
	Swimmer Deployment		S(1)		X
	Personnel Parachute Drop	S			X
	VFR Navigation		S(2)		X
	Visual Search		S(2)		X
	Electronic Search		S(1)	X	X
	Smoke/Flare Deployment		S(1)		X
	Scanning		S(2)		X
	Tactical Operations				
	Navigation System/Map Interpretation		S(2)		X
	Terrain Following/Avoidance			S	X
	Aerial Refueling			S	X
	Weapons Employment			S	X

		AST	FTD LEVEL			SIMULATOR LEVEL			ACFT
	PAVE LOW Night Mountain							S	X
	Mission Rehearsal							X(2)	X
	Defensive Operations								
	Threat Identification				S(1)				X
	Threat Avoidance							S(2)	O
	Evasive Maneuvering							S(2)	X
	Electronic Counter Measures								
	Ground Based Threats				S(1)				O
	Airborne Threats				S(1)				O
	Chaff and Flare Usage				S(1)			X(2)	O
	Emissions Control Training				S(1)			X	O
SYSTEMS PROCEDURES DURING ANY PHASE (Normal) (Abnormal) (Alternate) (Emergency)	Rotor/Transmission/Tail Rotor				S			X	O
	AFCS				S			X	O
	Fuel and Oil	S			X				O
	Electrical	S			X				O
	Hydraulic				S			X	O
	Flight Controls				S			X	O
	Anti-icing and Deicing System	S			X				O
	TF/TA Radar			S	X				O
	Flight Management Guidance Systems			S	X				O
	Approach and Landing Aids			S	X				O
	FLIR			S	X				O
	Airborne Weather Radar	S			X				O
	Flight Instrument System	S			X				O
	Navigation System/GPS	S			X				O
	Aircraft Fires		S					X	O
	Smoke Control		S		X				O
	Engine		S					X	O
	Fuel Jettison		S		X				O
	Landing Gear		S		X				O
	Bailout		S		X				O
	Communications Equipment								
	UHF/VHF/HF/FM	S			X				X
	Secure Voice	S			X				X
	Have Quick	S			X				X
	AFSATCOM	S			X				X

	AST			FTD LEVEL				SIMULATOR LEVEL		ACFT
GCI/AWACS/ABCCC Procedures	S			X						X

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[1] Requires visual system

[2] Requires wide-angle daylight, dusk, night visual

Table A5.7. Initial/Continuation/Upgrade Training for Gunners. Helicopter Qualifications

		AST	FTD LEVEL				SIMULATOR LEVEL				ACFT
			4	5	6	7	A	B	C	D	
FLIGHT PHASE	TRAINING EVENT										
PREPARATION	Preflight Visual Inspection				S						X
	Prestart Procedures		S		X						X
	Performance Limitations		X								X
SURFACE OPERATION	Taxi		S		X						X
	Pretakeoff Checks		S		X						X
			S		X						X
TAKEOFF	Normal			X							X
	Remote Site			X							X
CLIMB	Normal			X							X
EN ROUTE	Normal				S				X		X
DESCENT	Normal			X							X
APPROACHES	**VFR Procedures**										
	Normal		S		X(1)						X
	Remote Site				S(1)						X
	Tactical				S(1)						X
LANDINGS	Normal				S(1)				X		X
	Remote Site				S(1)						X
	Tactical				S(1)				X		X
AFTER LANDING	Emergency Evacuation	S						X			X
	Post Flight Visual Inspection				S						X

		AST	FTD LEVEL		SIMULATOR LEVEL					ACFT
										X
FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Scanning			S(2)						X
	Remote High Recon			S(2)				X(2)		X
	Remote Low Recon			S(2)				X(2)		X
	Visual Search			S(1)						X
	Smoke/Flare Deployment			S(2)						X
	Ditching			S						O
	Tactical Operations									
	Night Vision Device Use						S			X
	Aerial Refueling						S			X
	Weapons Employment						S(1)			X
	PAVE LOW Night Mountain						S			X
	Mission Rehearsal						X			X
	Defensive Operations									
	Threat Identification			S(1)						X
	Threat Avoidance						S(1)			O
	Chaff and Flare Usage			S(1)			S			X
SYSTEMS PROCEDURES DURING ANY PHASE	Bailout		S	X						O
	Fuel Jettison		S	X						O
	Aircraft Fires		S	X						O
	Smoke Control		S	X						O
	Weapon Systems		S	X						
(Normal)	**Communications Equipment**									
(Abnormal)	UHF/VHF/HF/FM	S		X						X
(Alternate)	Secure Voice	S		X						X
(Emergency)	Have Quick	S		X						X
	AFSATCOM	S		X						X
	GCI/AWACS/ABCCC Procedures	S		X						X

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[1] Requires visual system

[2] Requires wide-angle daylight, dusk, night visual